PATENT SPECIFICATION

381,354

Application Date Oct. 26, 1931. No. 29,680/31.

Complete Left: July 23, 1932.

Accepted: Oct. 6, 1932.

PROVISIONAL SPECIFICATION.

An Improved Electrical Joint, Coupling or Connection.

We, THE MACINTOSH CABLE COMPANY LIMITED, a British Company, ALFRED SARGENT and THOMAS ELDER, both British Subjects, all of the Works of the said Company, at Sinfin Lane, Normanton, Derby, in the County of Derby, do hereby declare the nature of this invention to be as follows:—

This invention relates to an improved electrical joint, coupling or connection; heretofore electric conductors have usually been attached directly to terminals, clips or other contacts on or in the article or device to which they have been connected; and which contacts have remained rigid or devoid of flexibility; in the case of movable electrical apparatus and the like the conductors usually take the form of a number of small wires stranded or bunched together in order to impart the desired flexibility resulting in the tendency for such conductors to break away near the point of attachment where all such movements are concentrated.

The object of the present invention is to provide a universal flexible electrical joint or coupling at the point of attachment or contact which will permit of free movement of the two parts of the connector without strain or movement of the conductors in the said joint or connection.

According to the invention we provide a joint of ball-and-socket, knuckle, pivoted or similar type that will permit of relative movement between the two parts thereof and will make electrical contact in any position.

We may provide a ball-ended insulated plug adapted to receive the conductors which are led through it and connected to suitable segmental or other contact plates or discs suitably exposed on the surface of the ball-end. The latter may be received by and retained in a suitable socket formed in a block or body of insulating material. Leads may be passed through said block or body and terminate in contacts adapted to bear against the contacts on the ball-end previously referred to, these further contacts being preferably in the form of spring-loaded balls or their equivalent.

It will be understood that the insulating block or body may form part of or be attached to any plug or piece of electrical apparatus with which it is desired to make a connection. It is preferably formed in two or more sections which may be secured together in any convenient manner so as to render the internal components easily accessible. The ball-end or plug portion may also be similarly constructed.

Dated this 26th day of October, 1931.

W. SWINDELL & SON,
Agents for the Applicants,
53, Queen Street, Derby.

COMPLETE SPECIFICATION.

An Improved Electrical Joint, Coupling or Connection.

We, THE MACINTOSH CABLE COMPANY LIMITED, a British Company, ALFRED SARGENT and THOMAS ELDER, both British Subjects, all of the Works of the said Company, at Sinfin Lane, Normanton, Derby, in the County of Derby, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to an improved electrical joint, coupling or connection.

Suggestions have previously been made to provide a terminal connection for storage battery plates comprising ball and socket members, the latter member being split to enable the socket to be applied to and removed from the ball member and provided with means for clamping said socket member in contact with the ball; an electrical plug has also been suggested having combined therewith a ball and socket joint forming an electrical connection, the ball and socket each having a circumferential band and a spherical cap of

conducting material which respectively contact to form an electrical connection, one of the spherical caps being provided with a spring to ensure close electrical contact with the co-acting cap.

According to the present invention in an electrical joint, coupling or connection having ball and socket members, each of a pair of plates or discs in one of such members is adapted to be engaged by one of a pair of spring-loaded contacting elements in the other member to make electrical contact under pressure in any position of the ball and socket.

The plates or discs are preferably exposed on the surface of the ball and electrical leads are connected to them internally of the ball.

The spring loaded contacting elements are preferably in the form of balls located within housings, the balls protruding through the ends of the housings under the pressure of the springs to engage with the said plates or discs.

The socket or body portion of the device is preferably divided longitudinally, the two halves being secured together by bolts or the like.

The housings are preferably located within recesses in the socket member and have formed therewith electrical connector contacts, such contacts and the housings, together with the balls and springs, being thereby removable each as a single unit.

Holes may be provided in suitable positions for the dissipation of any heat that may be generated.

A switch may be included adapted to break the connection internally of the device when required.

The invention will now be described with reference to the accompanying drawings upon which

Figure 1 is a side elevation of a connection.

Figure 2 is a sectional plan thereof.

Figure 3 is a plan of part of a socket portion showing a modification to be hereinafter referred to.

The conductors 4, encased in the protective sheathing 5, are passed through a tubular member 6 having a ball or enlarged spherical portion 7 at one end, contact plates or discs 8 being exposed on the outer surface of the part 7, the conductors 4 being secured in terminals or plugs 9 on the inside of the contact plates 8 by means of set screws 10, recesses being formed in the material of the part 7 to accommodate the set screws and to receive a screw-driver when required. The part 6 has a hole 11 to allow for the dissipation of any heat which may be generated. Parts of the open end of the part 6 are cut away as shown at 12 and a split collar or ring 28 of conical or tapering form is keyed in position as shown at 28^a and adapted to be tightened on to the conductors by means of the gland member 13 screwed on to the open end of the part 6. The plates 8 are engaged by bolts 14 pressed by springs 15 into contact with the plates 8. The springs are retained within housings 16, said housings being connected each by a strip 16^a with one of the connector contacts 17 into which any suitable plug-pins or legs are to be inserted. The housings 16 are shaped so that the balls may protrude partially through the ends thereof but cannot be pressed entirely out of said housings on the removal of the co-acting part 7 with the contact plates 8. The housings 16, strips 16^a and contacts 17 are arranged in recesses in a longitudinally divided insulating socket or body portion 18 shaped to receive such parts and formed as shown at 19 to constitute a socket for the part 7. The two halves of the body portion 18 are secured together by means of bolts 22, 23 passed through the holes 20 and 21, and having nuts or the like on their ends. The bolt 23 passes also through wings 24 on a covering or enclosing member 25 securing the latter in position. Holes 26 are formed in the part 19 to dissipate any heat which may be generated. The interior of one half of the body portion 18 is shown in Figure 3 modified by the incorporation of a switch 27 by means of which the connection between the housings, the recesses 16^b for which are shown in the figure, and the contacts, whose recesses are indicated at 17^a, may be broken when required.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. An electrical joint, coupling or connection having ball and socket members wherein each of a pair of plates or discs in one of such members is adapted to be engaged by one of a pair of spring-loaded contacting elements in the other member to make electrical contact under pressure in any position of the ball and socket.

2. An electrical joint, coupling or connection according to Claim 1, wherein the plates or discs are exposed on the surface of the ball and electrical leads are connected to them internally of the ball.

3. An electrical joint, coupling or connection according to Claims 1 or 2, wherein the spring-loaded contacting elements are in the form of balls located within housings, the balls protruding through the ends of the housings under the pressure of the springs to engage with the said plates

or discs.

4. An electrical joint, coupling or connection according to any of the preceding claims wherein the socket or body portion of the device is divided longitudinally, the two halves thereof being secured together by bolts or the like.

5. An electrical joint, coupling or connection according to Claim 3 wherein the housings are located within recesses in the socket member and have formed therewith electrical connector contacts, such contacts and the housings, together with the balls and springs being thereby removable each as a single unit.

6. An electrical joint, coupling or connection according to any of the preceding claims wherein holes are provided in suitable positions for the dissipation of any heat that may be generated.

7. An electrical joint, coupling or connection according to any of the preceding claims wherein a switch is included adapted to break the connection internally of the device when required.

8. An electrical joint, coupling or connection, constructed, arranged and adapted to operate as a whole, substantially as described with reference to the accompanying drawings.

Dated this 21st day of July, 1932.

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Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1932.

Fig. 1.

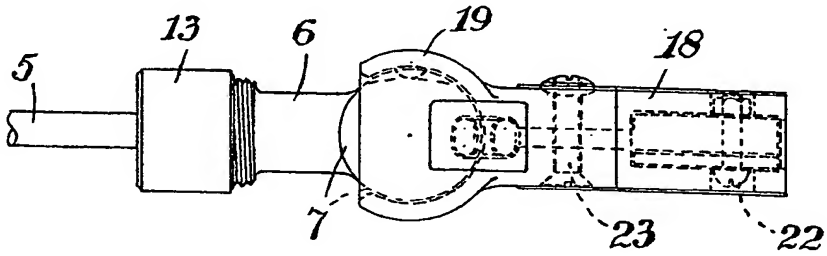


Fig. 2.

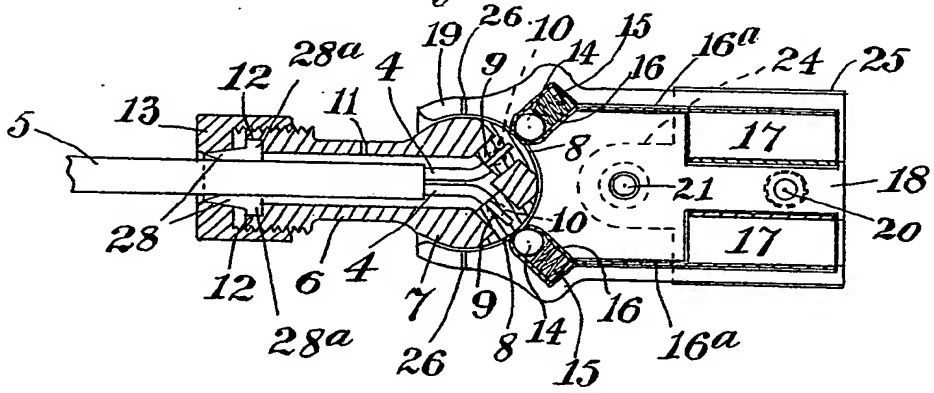
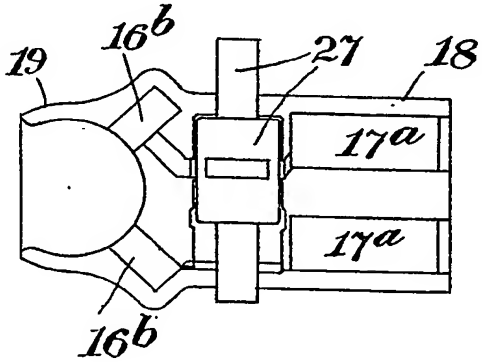


Fig. 3.



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